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| SCHIEF HARDIN, LLP PATENT DEPARTMENT 6600 SEARS TOWER CHICAGO, IL 60606-6473 | | | EXAMINER LLOYD, EMILY M | |
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/579,314

Applicant(s)

BLOMBERG ET AL.

Examiner

EMILY M. LLOYD

Art Unit

3736

Period for Reply -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 February 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 20-37 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 20, 26 and 32 is/are rejected.
- 7) ☒ Claim(s) 21-25, 27-31, 33-37 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SI-08)
- 4) ☐ Interview Summary (PTO-413)
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____
- Paper No(s)/Mail Date _____

DETAILED ACTION

1. This office action is in response to the amendment filed 27 February 2008. The Examiner acknowledges Applicant's amendments to claims 20, 24, and 26-37; as well as Applicant's amendments to the specification and Figure 9. Currently, claims 20-37 are pending.

Specification

2. The disclosure is objected to because of the following informalities: the first paragraph of the specification should be a section titled "Cross-Reference to Related Applications" and should include a reference to the priority claimed.

Appropriate correction is required.

Claim Objections

3. Claim 33 is objected to because of the following informalities: "normal" should be "normalize". Appropriate correction is required.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting

directly or indirectly from an international application filed before November 29, 2000.

Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

5. Claims 20, 26, and 32 are rejected under 35 U.S.C. 102(e) as being anticipated by United States Patent 6901286 (Sinderby et al.).

Regarding claims 20, 26, and 32, Sinderby et al. disclose a method (Figure 4), a device (Figure 1), and a computer-readable medium encoded with a computer program loadable into a computer (personal computer 19 Figure 1 is inherently programmed with the method of Figure 4 in order to execute the method) for extracting an EMG signal out of a raw signal, said raw signal being obtained by a plurality of electrodes adapted to interact with a patient to capture signals from the diaphragm of the patient (array of electrodes 12 on diaphragm 11 Figure 1), each electrode having an associated signal channel in which a raw signal is received from the associated electrode (Figures 2 and 3 each show 7 electrodes and 7 channels), said method comprising the steps of: for each of said channels, automatically electronically determining a signal-to-noise ratio for the raw signal in that channel (step 406 Figure 4, also Column 10 line 33-Column 11 line 10); for each of said channels, automatically electronically determining a weighting factor for that channel dependent on the signal-to-noise ratio of that channel (Column 8 lines 26-52; note especially "interference" in line 51; interference is the distorted portion of a received signal, therefore interference is noise; using the interference or noise of a signal to calculate a weighting factor is using the signal-to-noise ratio (where the signal is also known, which must be known to calculate the interference or noise) to calculate

a weighting factor); and weighting the respective raw signals from the channels by the respective weighting factors determined for the channels, to obtain weighted raw signals (step 405 Figure 4; also Column 8 lines 26-52, note especially Column 8 line 51 "interference"), and summing the weighted raw signal to obtain a summed signal representing a total EMG signal in said raw signals (step 408 Figure 4, also Column 11 lines 22-36). Sinderby et al. also disclose an analysis unit (personal computer 19 Figure 1) that performs the analysis steps.

Allowable Subject Matter

6. Claims 21-25, 27-31, and 33-37 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.
7. The following is a statement of reasons for the indication of allowable subject matter: the limitations of "automatically electronically estimating a level of ECG activity in the raw signal" along with "automatically electronically determining said signal-to-noise ratio based on the estimated level of ECG activity and the estimated level of EMG activity" and the limitations of claim 20, 26, or 32 are not found in the prior art.

Response to Arguments

Regarding Applicant's arguments regarding claims 20, 26, and 32, the Examiner has amended the rejections to better address the calculation of the signal-to-noise ratio. Regarding Applicant's arguments that Sinderby et al. is only weighting signals based on correcting for cancellation and distance damping effects, the Examiner notes that Column 8 line 51 specifically cites "interference" as being described by the weighting

functions. Further, as Equation 3 of Sinderby et al. has multiple functions with respect to n , where n is the specific electrode (Column 8 lines 12-14), the weighting factor is determined for each individual channel. Regarding Applicant's argument that all of the noise is eliminated in step 401 of Sinderby et al., the Examiner disagrees, as filtering does not completely eliminate all noise and as the Sinderby et al. reference itself still refers to interference and signal-to-noise ratios after the filtering, indicating that some level of noise still exists.

Applicant's arguments, see pages 16 and 17, filed 27 February 2008, with respect to claims 21, 23-25, 27, 29-31, 33, and 35-37 have been fully considered and are persuasive. The Examiner notes that as the ECG is filtered out of the raw signal before any further analysis of the signal, including a later signal-to-noise ratio calculation, the reference of Sinderby et al. does not meet the limitations of claims 21, 27, and 33. The rejections of claims 21, 27, 33, and their dependent claims have been withdrawn.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to EMILY M. LLOYD whose telephone number is (571)272-2951. The examiner can normally be reached on Monday through Friday 8:30 AM - 5 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Max Hindenburg can be reached on 571-272-4726. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 3736

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Emily M Lloyd
Examiner
Art Unit 3736

/EML/

/Max Hindenburg/
Supervisory Patent Examiner, Art Unit 3736